jects from the analysis because they are on statins effectively excludes the majority of patients undergoing coronary surgery. We report that clopidogrel, unlike aspirin, did not inhibit platelet aggregation in the first 5 postoperative days, a result that is applicable to the wider population of patients irrespective of the eventual outcome of the drug interaction debate.

Little consideration has been given to the suggestion of excluding nonresponders and low responders from the analysis. If we did that for any arm of any trial only the favorable responders would be left, giving the false impression of treatment efficacy. It is plausible that increasing the dose of clopidogrel may increase antiplatelet effects in similar conditions (but this should not be assumed). However, the current recommended dose is 75 mg per day, and a loading dose of clopidogrel is only indicated in unstable angina (300 mg single loading dose).[3] This information is consistent with the product information sheet issued by Sanofi-Synthelabo (New York, NY).

Our aim was to report the results of an intention-to-treat randomized clinical trial, using approved drug doses, with findings that can be generalized to the wide population undergoing coronary surgery, not to manipulate analyses to favor any particular arm.

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## Clinical efficacy of retrograde coronary sinus perfusion in off-pump surgery

***To the Editor:***

I read with great interest the article by Castella and Buckberg[1] on retrograde coronary sinus perfusion in off-pump surgery. My colleagues and I have been constantly stimulated by the pioneering work of Dr Buckberg on myocardial preservation. It is indeed very gratifying and encouraging to know that the technique we[2] have been using regularly since September 1997 to perform off-pump coronary artery bypass grafting (OPCABG) with no ischemia during periods of construction of the distal anastomosis has been proven by the very elegant work of Castella and Buckberg[1] to be effective in reducing systolic and diastolic dysfunction during periods of coronary occlusion. In our technique, after midsternotomy a retrograde coronary sinus catheter is inserted and connected to an antegrade cannula in the ascending aorta.[2] Perfusion is now allowed through this route from the aorta to the coronary sinus, onward through the capillaries to the myocardium, and out through the arterioles at the site of ischemia. There is ample proof that ischemia is relieved as evidenced by the following facts: (1) reversion of electrocardiographic changes of ischemia, (2) vigorous backbleeding of dark blood on temporary release of the distal snare after arteriotomy, and (3) a good oxygen extraction ratio across the myocardium calculated by sampling blood from the antegrade cannula and from the arteriotomy.[3]

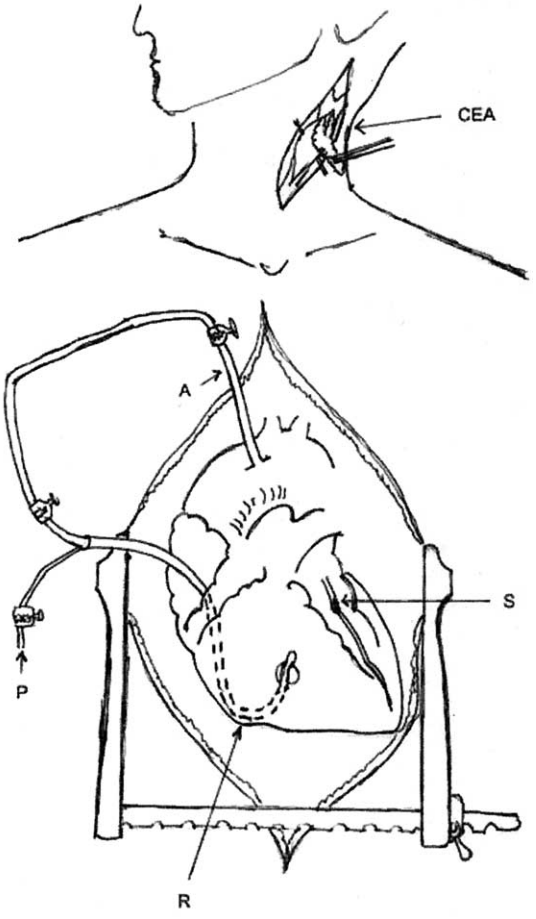


**Figure 1. Technique of retrograde perfusion during combined carotid endarterectomy and coronary artery bypass grafting. *A,* Antegrade cardioplegia cannula; *R,* retrograde coronary sinus cannula; *S,* stenosed coronary artery; *CEA,* carotid endarterectomy in progress; *P,* pressure monitoring line.**

We have now gone one step further and use the method of active retroperfusion, using the driving pressure and oxygen of the aortic blood to perfuse areas of pre-existing acute ischemia. In grossly unstable patients with critical left anterior descending or left main stenosis, we have observed that retrograde coronary sinus perfusion reverses electrocardiographic changes, reduces pulmonary artery pressures, immediately improves cardiac contractility, and improves cardiac output (unpublished data). This gives time to harvest appropriate conduits, to perform any concomitant extracardiac procedure, and avoids "crashing" on cardiopulmonary bypass. One 75-year-old patient with vascular disease and cardiogenic shock was on preoperative intraaortic balloon counterpulsation and preoperative ventilation, with associated critical bilateral extracranial symptomatic internal carotid artery disease. Retrograde coronary sinus perfusion allowed stabilization of the cardiac status and gave time to perform a carotid endarterectomy (Figure 1) followed by an OPCABG, with a good outcome.[4]

My technique is a combination of pressure-controlled intermittent coronary sinus occlusion and arterial retroperfusion of the coronary sinus. Possibly a better method physiologically may well be a combination of synchronized retroperfusion and pressure-controlled intermittent coronary sinus occlusion. There is a great potential for developing catheters that could be inflated in the coronary sinus 6 times per minute,[5] but while that happens I would recommend my simple technique of retrograde perfusion as a useful tool in the armamentarium of the cardiac surgeon for elective OPCABG as also for the acutely ischemic patient, in whom one gains some time and possibly avoids the institution of cardiopulmonary bypass. I would wholeheartedly agree with Lazar[5] that a backward technique can still achieve forward progress.

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## What is the true (unbiased) percentage freedom from atrial fibrillation at 6 months after the modified Cox maze procedure using bipolar radiofrequency energy?

***To the Editor:***

We read with interest the article by Gaynor and associates[1] concerning the results of their prospective study of a consecutive group of 40 patients with 100% follow-up in which they reported a 91% freedom from atrial fibrillation (AF) at 6 months.

However, the denominator of patients at 6 months was only 23; therefore, 43% (17 patients) remained unaccounted for at that time point (presumably because they had not yet reached the 6-month interval). The authors used "at last follow-up" analysis to declare 100% follow-up, but usually the percentage follow-up is reported as the number of patients at the last time point (in studies with a pre-planned stopping point). In this case, some would consider the result of reporting only 23 of the 40 potential patients to have the same degree of inaccuracy as a loss to follow-up of 17 of 40 (43%).

A 91% freedom from AF at 6 months is based on the assumption that the remaining 17 patients will not alter this percentage when followed up to 6 months (note the 71% freedom from AF in the first month with 38 patients). However, in an extremely pessimistic situation (should AF subsequently develop in all 17 patients), the results could potentially be 21/40 (53%) freedom from AF at 6 months and 11/40 (28%) freedom from AF and antiarrhythmic medication at 6 months. We do acknowledge, however, that the true estimate would probably lie somewhere between the best- and worst-case scenarios.

Moreover, 10 (43%) of the 23 patients were receiving antiarrhythmic medication at 6 months. Unless the authors prescribed prophylactic antiarrhythmic therapy, it seems natural to assume that the 10 patients were having AF up to and including the 6-month interval. The authors also included 5 patients (13%) who were in paroxysmal AF at the start of the study, and 6 patients (15%) required pacemakers postoperatively due to sick sinus syndrome. Should freedom from AF be attributed to surgery in these patients?

A Kaplan-Meier analysis would have been more suitable to account for the unavailable/censored numbers that increased from 2 to 7 to 17 by 6 months if (any) AF was counted as evidence of an event (regardless of subsequent rhythm). We note that in this study, patients had different AF status at different follow-up times (evident from the increasing numerator between the first and third months), and perhaps more sophisticated methods needed to be employed (recurring time-to-event analysis) to quantify the uncertainty in the estimation of the time-dependent results.

In the same vein, Figure 6 in the manuscript is somewhat misleading. The denominator at the 4 time points decreased from 38 to 33 to 23; therefore, the apparent improvement could still be distorted by the yet-to-be completed follow-up.

Bearing in mind the lower limit of the confidence interval of 21/23 (95% confidence interval, 72% to 99%), we respectfully express our reservations to the conclusions of this otherwise novel and exciting modification of the Cox procedure.

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